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CR-130790

LAND USE MAPPING AND MODELLING FOR THE PHOENIX QUADRANGLE

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1 March 1973

Type I Progress Report for Period 1 January 1973 - 28 February 1973

(E73-10340) LAND USE MAPPING AND
MODELLING FOR THE PHOENIX QUADRANGLE
Progress Report, 1 Jan. - 28 Feb. 1973
(Geological Survey) 7 p HC \$3.00

N73-19339

CSCS 08B G3/13

Unclas
00340

Prepared for:

Goddard Space Flight Center
Greenbelt, Maryland 20771

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U.S. Department of Commerce
Springfield, VA. 22151

Type I Progress Report

ERTS-1

1 January 1973 - 28 February 1973

a. Land Use Mapping and Modelling for the Phoenix Quadrangle.
(ERTS-A Proposal SR-186)

b. IN-057

c. Statement and explanation of any impedance:

Only one MSS band 7 image has yet been received. Copies of MSS frame sets and color transparencies are being ordered retrospectively from NASA Goddard by special order form. No cloud-free sets (bands 4, 5, 6 and 7) have yet been received showing most of the Phoenix (Arizona) Quadrangle test site in one view, although partial sets have been received. More cloud cover than anticipated has apparently resulted in very few images being received for the late fall and winter periods which cover the test site. High altitude aircraft underflight photography requested a year ago for checking the accuracy of interpretation of land use data from ERTS imagery has not yet been received.

d. Accomplishments during the reporting period and those planned for the next period:

Examination of imagery which became available during the reporting period allowed updating of the map of land use change detected from ERTS imagery in the Phoenix Quadrangle. MSS 9 x 9 imagery was examined on an I²S Color Additive Viewer, a Richardson Film Projection Viewer at 10X magnification, and in microfiche viewers at 12X and 18X magnification.

Images of the Phoenix area covering a ten week period from August to November were examined to establish possible relationships between seasonal changes in vegetated areas and detection of changes in land use.

Portions of MSS images were examined on a Spatial Data Systems Data Color System 703-32 color density slicer. Urban, agricultural, and rangeland areas were examined separately and in combination to determine to what extent density patterns aid in determining land use or detecting changes in land use. The equipment allowed up to thirty-two equally spaced density levels to be detected from MSS 9 x 9 black and white transparencies and displayed in color on the television unit. Transparencies were also examined over restricted density ranges to eliminate undesired low and high densities and to provide greater detail over the desired density range of the transparency.

Color slides were taken showing displays on the television unit of the color density slicer and the viewing screen of the I²S viewer. These allowed comparison of results with earlier composites photographed on the I²S viewer and provided a visual record of experimentation performed using the color density slicer.

During the next reporting period, further experimentation will be conducted to determine the effects of seasonal vegetation change on land use change detection. This will be dependent upon imagery being received covering the test site during the winter months. Work also will begin on using available high-altitude aerial photography covering portions of the test site to check the accuracy of land use changes previously detected from ERTS imagery. A complete check of the test site will be accomplished when previously requested underflight photography covering the entire Phoenix Quadrangle is received.

e. Scientific results and practical applications:

Comparison of 9 x 9 MSS band images and color composites made from bands 4, 5, and 6 showing vegetated areas near Phoenix during the summer and fall seasons aided in definitely establishing that certain land areas were being used as agricultural land and not as rangeland. Agricultural land, which appeared to be fallow, idle, or not irrigated, often became more readily identifiable as agricultural land when comparing different images of identical land areas which have been affected by seasonal vegetation changes.

Experimentation with color density slicing portions of 9 x 9 MSS band 7 transparency showing the central urban core of Phoenix enabled dense commercial and industrial areas to be separated from less dense urbanized land uses; however, loss of resolution

produced results of limited usefulness. The best results in agricultural areas near Sun City were obtained using MSS band 5 imagery. Discrimination of different land uses in both urban and agricultural areas which were color density sliced was not possible to the degree of accuracy necessary to make mapping feasible. Color density slicing techniques may be useful in identifying areas which merit further study with more definitive methods.

Examination of MSS transparencies and color composites allowed updating of a map of land use change in the Phoenix Quadrangle. (Category 2H, Land Use Survey and Mapping General)

f. Published reports or talks:

None

g. Recommendations for improvement:

It would be advantageous to send out all four bands of ERTS MSS imagery to those principal investigators requiring color infrared composites for their work. Although the 9.5 inch transparencies definitely are useful, some distribution of the 70 mm images might help also in allowing a broad overview in the Color Additive Viewers.

h. Changes in Standing Order Forms:

Changes in Standing Order Forms will be submitted during the next reporting period.

i. ERTS Image Descriptor Forms:

ERTS Image Descriptor Forms are attached at the end of this report.

j. Changed Data Request Forms submitted to Goddard Space Flight Center/NDPF:

None

(See Instructions on Back)

ORGANIZATION Geographic Applications Program, U.S.G.S.

ID _____

PRODUCT ID (INCLUDE BAND AND PRODUCT)	FREQUENTLY USED DESCRIPTORS*			DESCRIPTORS
	Agricult.	Rangeland		
1159174425	x	x		
1159174455	x	x		

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